

## Biodiversity assessment : Nine new records of coral reef fishes from Andaman and Nicobar islands

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### Abstract

The following nine new records of fishes for Andaman and Nicobar Islands are reported from the coral reef ecosystems in Ritchie's archipelago: ***Cymbacephalus beauforti*** (Knapp, 1973), ***Ostorhinchus nanus*** (Allen, Kuitert & Randall, 1994), ***Platax batavianus*** Cuvier, 1831, ***Plectorhinchus ceylonensis*** (Smith, 1956) Ceylon Sweetlips, ***Upeneus sundaicus*** (Bleeker, 1855) Sunda Goatfish, ***Asterorhombus intermedius*** (Bleeker, 1865) Intermediate Flounder, ***Engyprosopon macrolepis*** (Regan, 1908) Largescale Dwarf Flounder, ***Paramonacanthus pusillus*** (Ruppell, 1829) Faintstripe Filefish, ***Rudarius excelus*** Hutchins, 1977 Diamond Filefish, during recent field surveys. The aim of this work is to add new information on the additions of fishes from these Islands. With the addition of nine species a total of 1450 species of fishes under 576 genera belonging to 33 orders and 165 families are known from Andaman and Nicobar Islands.

**Key words** - Coral Reef Fishes, New Records, Andaman and Nicobar Islands.

### Introduction

Andaman Nicobar Islands situated in the Bay of Bengal between 6°45' -13 45' N and 92°10' – 94°15'E, consist of 352 islands 220 islets and rock and cover a distance of almost 470 km over North South, with a coastline of 1962 km, and bring in for India an Exclusive Economic Zone (EEZ) of 600 thousand sq km. The coast is under the influence of a diverse set of oceanographical and ecological conditions. The shelf topography of these islands show frequent rises supporting coral reefs, which are characterized as fringing reefs on the eastern side and barrier reefs off west coast; the depressions are known as passages and straits. Besides coral reefs, the shore is composed of rocky and sandy areas and vast stretches of mangrove swamps, also few freshwater rivers and streams. A comprehensive and authoritative account of fishes of the Indian region including Andaman and Nicobar Islands was published by Francis Day (1870, 1875-78 and 1888). Herre (1941) listed 490 species of fishes. Talwar (1990) prepared a comprehensive list of fishes consisting of 724 species, followed by a supplementary list by Kamla Devi (1991) containing 71 species of fish. The recent developments in the fish taxonomy of these Islands are the works by Kamla Devi and Rajan (1991), Misra and Krishnan (1992), Krishnan and Misra (1992), Dhandapani and Misra (1993), Rajan (2001 a, 2001b,

2003, 2009), Rajan *et al.* (1992), Kamla Devi *et al.* (1993), Kamla Devi and Rao (1997, 2003, 2007), Rao *et al.* (1992, 1992a, 1993a, 1997), Rao (2003, 2009), Rao and Kamla Devi (1996, 1997a, 1997b, 1998, 2004), Soundararajan and Dam Roy (2004), Remadevi *et al.* (2010) Rajaram *et al.* (2007), Ramakrishna *et al.* 2010. Smith-Vaniz, 2011, Smith-Vaniz and Allen (2012), Rajan and Sreeraj (2013).

### Materials and methods

The new records of fishes were made by field surveys and underwater observations in the coral reef ecosystem using scuba gears in Ritchie's archipelago of Andaman and Nicobar Islands. The reefs are fringing with sandy patches also and depth from 5m to 22m. The photographs were taken in the coral reef areas from 7m to 30m with the camera Canon EOS 5D Mark III by the authors. Taxonomic classification follows Nelson (2006).

### Results and discussion

The last few years represent a significant increase of knowledge about the fishes of Andaman and Nicobar Islands. During this study 9 new record of fishes were recorded under 4 orders, 7 families and 9 genera as ***Cymbacephalus beauforti*** (Knapp, 1973), ***Ostorhinchus***

*nanus* (Allen, Kuitert & Randall, 1994), *Platax batavianus* Cuvier, 1831, *Plectorhinchus ceylonensis* (Smith, 1956) Ceylon Sweetlips, *Upeneus sundaicus* (Bleeker, 1855) Sunda Goatfish, *Asterorhombus intermedius* (Bleeker, 1865) Intermediate Flounder, *Engyprosopon macrolepis* (Regan, 1908) Largescale Dwarf Flounder, *Paramonacanthus pusillus* (Ruppell, 1829) Faintstripe Filefish, *Rudarius excelus* Hutchins, 1977 Diamond Filefish, are associated with coral reef habitats. A detailed description of morphological features of the newly recorded fish species with their habitat and distribution are presented.

## SYSTEMATICS

Order SCORPAENIFORMES

Family PLATYCEPHALIDAE Flatheads

*Cymbacephalus beauforti* (Knapp, 1973) Crocodile Flathead

*Platycephalus (Cymbacephalus) beauforti* (Knapp, 1973); *Proceedings of the Biological Society of Washington* v.86 (no. 10): 119 fig. 1. (Type locality: Urukthapel Island, Palau Islands).

*Cymbacephalus beauforti* Allen & Erdmann 2012: *Reef fishes of East Indies*: 254.

D IX-X + 11; A 11; P 19-21; LLS 50-55, anterior 1-3 bearing a small weak spine; prominent pit behind eye; preopercular spines 2-3 about equal in length; preorbital spines absent; supraorbital ridge usually smooth over eye and a few small spines posteriorly; iris lappet cirrose. Attains 47 cm. Variable depending on substrate, ranging from mottled grey brown to nearly blackish. Coral reefs and mangrove areas, generally on sand or rubble bottom. Palu, Yap, New Caledonia, Ryukyu Islands and in East Indian region.



Order PERCIFORMES

Family APOGONIDAE (Cardinalfishes)

*Ostorhinchus nanus* (Allen, Kuitert & Randall, 1994)

*Apogon nanus* Allen, Kuitert & Randall, 1994. *Revue française d'Aquariologie Herpetologie* v. 21 (nos 1-2): 29, fig. 2-3. (Type locality: Maumere, Flores, Indonesia).

*Ostorhinchus nanus* Allen & Erdmann 2012: *Reef fishes of East Indies*: 399.

D VI + I, 9; A II, 8; P 13; LLS 24. Semitransparent with golden brown midlateral stripe extending onto caudal fin and narrow pearly white stripe immediately above and below midlateral stripe. Attains 3.5 cm. Silty coastal reefs and lagoons. Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon and Andaman and Nicobar Islands.



Family EPHIPPIDAE (Batfishes)

*Platax batavianus* Cuvier, 1831

*Platax batavianus* Cuvier, 1831. Hist Nat. poiss. V.7: 225. (Type locality: Jakarta, Java, Indonesia).

*Platax batavianus* Allen & Erdmann 2012: *Reef fishes of East Indies*: 1003.

D VII, 29-32; A III, 21.23; P 18-19; Pored lateral line scales 64-70. Adults relatively elongate, developing hump in front of eye with growth; also differs from other *Platax* in having seven rather six dorsal spines. Silvery with dark brown bar through eye, broad brown bar at level of pectoral fins, irregular black markings on belly, broad black margin on belly, broad black margin on anterior anal fin, blackish pelvic fins and yellowish caudal fin. Small juvenile with intricate zebra-like pattern of black and white bars. Attains 50 cm. Solitary or groups. Inshore reefs. Malaysia, Indonesia, Philippines, Papua New Guinea and Australia.



Family **HAEMULIDAE** (Sweetlips)

*Plectorhinchus ceylonensis* (Smith, 1956)  
Ceylon Sweetlips

*Gaterin ceylonensis* Smith, 1956. *Annal. Magaz. Nat. Hist.* (Series 12) v (9) no. (98): 99. (Type Locality: Sri Lanka).

*Plectorhinchus ceylonensis* Allen & Erdmann 2012: *Reef fishes of East Indies*: 472.

D XIV, 19; A III, 7-8; LLS 65. Caudal fin slightly emarginated. Silvery grey overall, white on lower head, narrow brownish yellow margin on upper rear edge of operculum, black pectoral fin axil and black fins. Attains 45 cm. Small to large aggregations. Coastal fringing reefs.

Sri Lanka and Andaman Islands. It is very common all around the islands reef.



Family **MULLIDAE** (Goatfishes)

*Upeneus sundaicus* (Bleeker, 1855) Sunda

*Upeneoides sundaicus* Bleeker, 1855. *Nat. Tijd. Ned. Indie*, v 8:411. (Type Locality: Ambon, Molucca Islands, Indonesia).

*Upeneus sundaicus* Allen & Erdmann 2012: *Reef fishes of East Indies*: 510.

D VIII, 9; A I, 7-8; P 14-15; LLS 31-31. Greyish on back with scattered red-orange spots, silvery on side, broad red bar below eye, horizontal row red to orange spots along side at eye level, yellow barbels, 3-5 faint dark, oblique bands on upper caudal-fin lobe and red and white streaks on lower lobe. Attains 14 cm. Silty bottoms, occasionally near reefs. Arabian Gulf to northern Australia and Philippines, East Indian locations include Malaysia, Philippines, Indonesia and Andaman Islands.



Order **PLEURONECTIFORMES**

Family **PLEURONEDIDAE** (Flounders)

***Asterorhombus intermedius*** (Bleeker, 1865) Intermediate  
*Platophrys (Arnoglossus) intermedius* Bleeker, 1865.  
*Nat. Tijds. Voor Dierk.*, v 3 (5); 47. (Type locality: Manado,  
Sulawesi, Indonesia).

*Asterorhombus intermedius* Allen & Erdmann 2012: *Reef  
fishes of East Indies*: 1046.

D 79-86; A 57-65; P 10-13 on eye side, 8-10 on blind  
side; pelvic rays 6; LLS 46-57; scales ctenoid on eyed side,  
cycloid on blind side; lower eye slightly anterior to upper;  
upper jaw extending to below front edge of lower eye or  
slightly posterior; teeth uniserial in both jaws. Blotchy  
pale brown with three rows of large black edged pale  
spots enclosing black dots. Attains 15 cm. Sand and mud  
bottoms, sometimes in vicinity of reefs. Red Sea and East  
Africa to Tonga, north to Japan; ranges throughout East  
Indian region.



***Engyprosopon macrolepis*** (Regan, 1908) Largescale  
Dwarf Flounder

*Scaeops macrolepis* Regan, 1908. *The Trans. Linn. Soc.  
London. Second series. Zoology* v.12 : 233. Pl. 27(fig.  
4). (Type Locality: St. Brandon's Shoals, western Indian  
Ocean).

*Engyprosopon macrolepis* Allen & Erdmann 2012: *Reef  
fishes of East Indies*: 1048.

D 76-85; A 58-63; P 11-13 on eyed side; Pelvic rays 6;  
LLS 43-51; scales ctenoid on eyed side, cycloid on blind

side; upper jaw extending to below front edge of lower  
jaw; teeth in jaws uniserial. Densely mottled with shades  
of brown, black and white. Attains 7.5 cm. Sand and  
mud bottoms near reefs. Red Sea, St. Brandon's Shoals,  
Maldives, Philippines, Papua New Guinea, New  
Caledonia and Andaman Islands.



Order TETRAODONTIFORMES

Family MONACANTHIDAE (Filefishes)

***Paramonacanthus pusillus*** (Ruppell, 1829) Faintstripe

*Monacanthus pusillus* Ruppell, 1829. *Fische des Rothen  
Meers*: 34. (Type Locality: Massaua, Eritrea, Red Sea).

*Paramonacanthus pusillus* Allen & Erdmann 2012: *Reef  
fishes of East Indies*: 1076.

D II + 25-30; A 24-29; P 11-13. First dorsal spine origin  
above posterior half of eye; second dorsal anal fins  
elevated anteriorly; dorsal profile of the snout convex  
in male, usually with prominent hump just in front of  
nostrils, slightly convex to straight in female and juvenile;  
caudal fin rounded to double emarginated, upper and  
lower lobe filamentous in male. Greyish on dorsal half  
with 3-4 broad, diffuse brown stripes, grading to white on  
ventral portion of head and body. Attains 18.5 cm. Mud  
or sand bottoms near reefs. Southern Red Sea and South  
Africa to East Indian region and north-western Australia  
to Japan.



***Rudarius excelsus*** Hutchins, 1977 Diamond Filefish

*Rudarius excelsus* Hutchins, 1977. *Rec. West. Aust. Mus.* 5 (1): 3-58. (Type Locality: Near Lindeman Island, Queensland, Australia).

*Rudarius excelsus* Allen & Erdmann 2012. *Reef fishes of East Indies*: 1079.

D II, 22-24; A 20-22; P 10; first dorsal spine shorter than snout, its origin above posterior half of eye; body very deep and more or less diamond shaped, depth at level of anal fin origin; snout profile straight to concave; eye relatively large; pelvic spine movable with small but conspicuous ventral flap; caudal fin rounded. variable colour from mainly green to black. Attains 2.5 cm. Weed bottoms near reefs. Australia, Papua New Guinea, Malaysia, Andaman and Nicobar Islands and Ryukyu Islands.



## Conclusions

All the nine species *Cymbacephalus beauforti* (Knapp, 1973), *Ostorhinchus nanus* (Allen, Kuitert

& Randall, 1994), *Platax batavianus* Cuvier, 1831, *Plectorhinchus ceylonensis* (Smith, 1956), *Upeneus sundaicus* (Bleeker, 1855), *Asterorhombus intermedius* (Bleeker, 1865), *Engyprosopon macrolepis* (Regan, 1908), *Paramonacanthus pusillus* (Ruppell, 1829) Faintstripe Filefish, *Rudarius excelsus* Hutchins, 1977 are new additions to Indian waters. These islands, and the directly southern Nicobar Islands, lie in the eastern outer part of the Bay of Bengal, just west and adjacent to the Coral Triangle, the richest area for marine life in the world. Its base ranges from Sumatra to New Guinea and its apex to the Philippines. It seems that the Andaman and Nicobar Islands coast has a regular connectivity with the south-eastern coast of Indonesia and north-eastern coast of Burma as observations of tropical affinity species. The fish diversity in these waters also receives special interest in terms of marine zoo-geography because of the confluence of Andaman Sea fishes with Western Pacific and the Eastern Indian Ocean. Long-term monitoring studies will allow a better understanding of connectivity patterns along the coast of Andaman and Nicobar Islands as well as the possible establishment of new populations of species. With the addition of nine species a total of 1450 species of fishes under 576 genera belonging to 33 orders and 165 families are known from Andaman and Nicobar Islands.

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